SONY

A-CKC-100-**11**(1)

HD Color Video Camera

Technical Manual



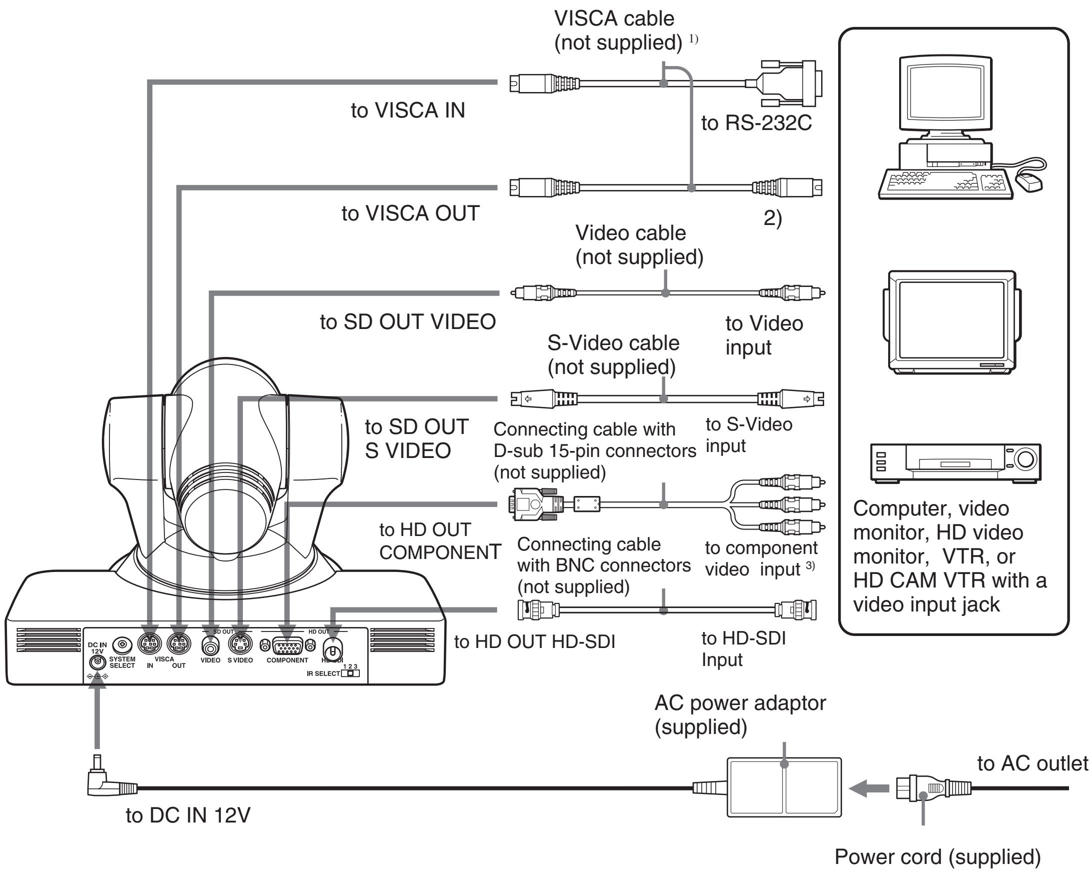
EVI-HD1

Table of Contents

Features

- The CMOS video camera provides 2,000,000 effective picture elements (pixels) that can shoot high-definition images to offer superior picture quality.
- By adopting the DD motor mechanism, in addition to high-speed pan/tilt action, improvement of the noise reduction mechanism lets you use the camera for a variety of purposes.
- The camera allows you to shoot an image using the 1080i high definition video format, which is equivalent to an HD-TV broadcast.
  The camera is compatible with 14 formats, including 59.94 Hz, 50 Hz and the SD video format.
- The camera outputs HD image, conforming to the SMPTE292M serial digital interface standard. This allows long distance transmission of high-quality camera images.
- The camera is equipped with an RS-232C communication interface. You can select the baud rate of either 38400 bps or 9600 bps. This allows you to remotely control the camera at a high communication speed.

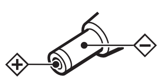
Connection



1) When the camera is connected to a computer with a VISCA cable (cross type, RS-232C), you can operate the camera with the computer. To obtain a cable, consult the dealer where you bought your camera.
2) To VISCA IN of other EVI-HD1s (when connecting to more than one camera)
3) The HD OUT COMPONENT output is not compatible with a computer display that does not support HDTV formats.

Notes

- You cannot connect your Color Video Camera to a computer that is not equipped with either video input or an S-Video input connector.
- Use only the AC power adaptor (JEITA type4) supplied with the unit. Do not use any other AC power adaptor.

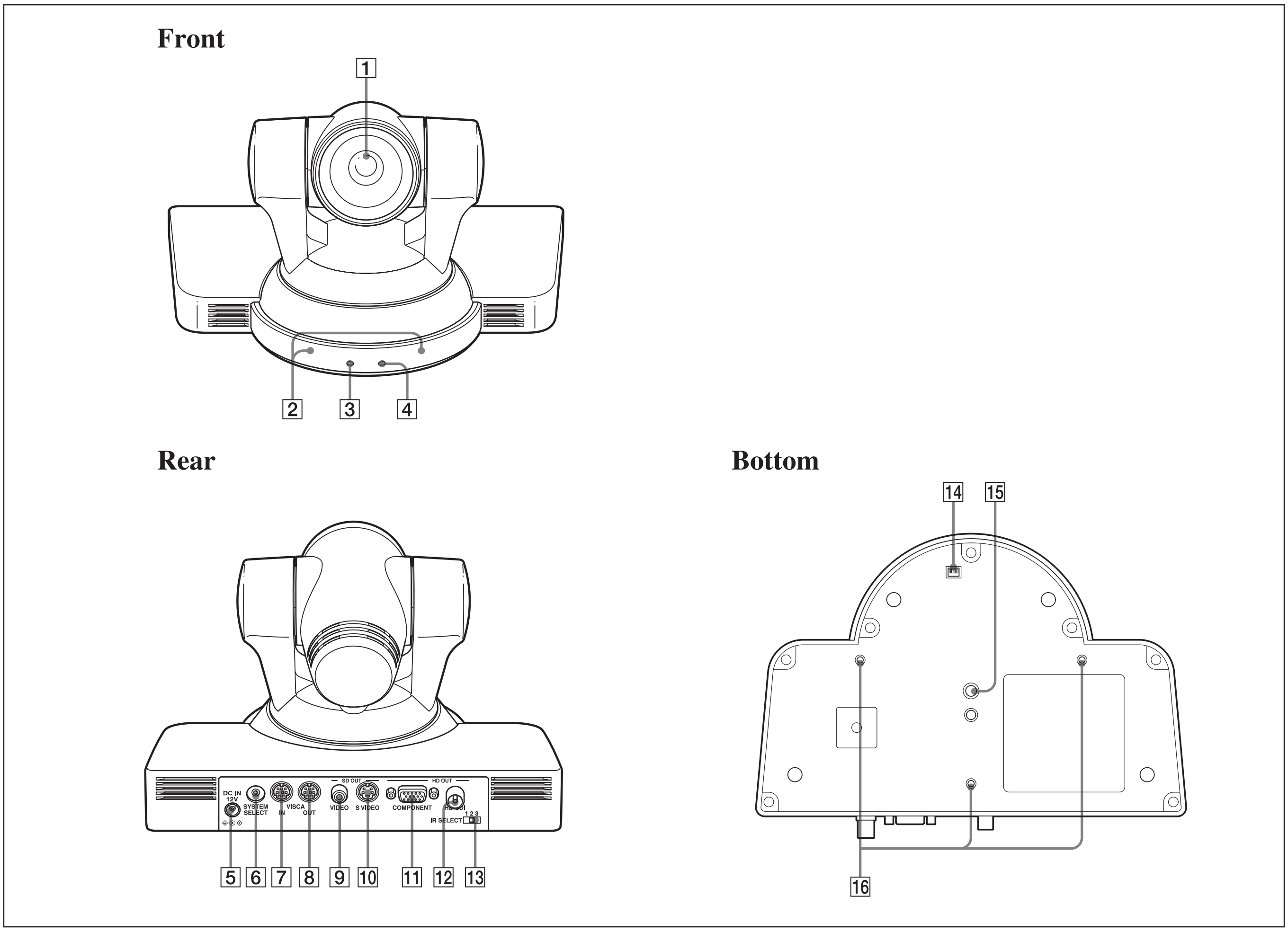


Polarity of the plug

- You have to set the video format of the signal to be output from the camera. For detailed information on how to set the video format, see "5 SYSTEM SELECT switch" on page 5.

Locations of Controls

Main Unit



1 Lens

2 Remote sensors

3 POWER lamp

4 STANDBY lamp

For detailed information on LED status of the POWER lamp and STANDBY lamp, see "LED Status" on page 37.

5 DC IN 12V connector

6 SYSTEM SELECT switch

This switch allows you to select the video format of the signal to be output from the HD OUT COMPONENT, HD OUT HD-SDI, SD OUT VIDEO and SD OUT S VIDEO connectors.

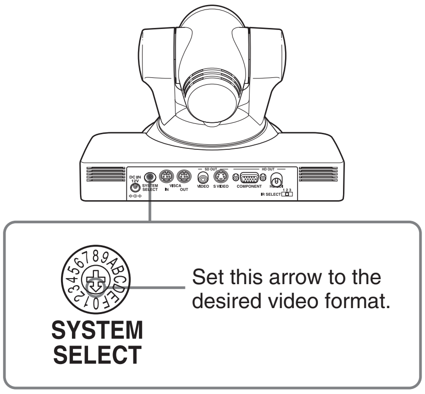
Notes

- Be sure to set this switch before you turn on the power of the camera. You can also set this switch in the standby mode of the camera. After completing the setting, turn on

(Continued)

the power of the camera by connecting it to an AC outlet using the supplied AC power adaptor and AC power cord, or by using the VISCA command. When you set this switch in the standby mode, press the POWER switch of the remote commander. This switch setting becomes effective.

- Be sure to use a Phillips-head screwdriver when changing the switch position. If you use a tool other than the designated screwdriver, the crossed groove may be damaged.



Switch position	Video format	HD OUT	SD OUT
0	1080i/59.94	○	—
1	1080p/29.97	○	—
2	720p/59.94	○	—
3	720p/29.97	○	—
4	NTSC (LB)	—	○
5	NTSC (CR)	—	○
6	NTSC (SQ)	—	○
7	No output	—	—
8	1080i/50	○	—
9	1080p/25	○	—
A	720p/50	○	—
B	720p/25	○	—
C	PAL (LB)	—	○
D	PAL (CR)	—	○
E	PAL (SQ)	—	○
F	No output	—	—

○: Outputs the image signal.
—: Does not output the image signal
LB: Abbreviation of LETTER BOX. A video signal with the 16:9 aspect ratio is output by adding a blank area (no signal, black) top and bottom to display the image without distortion on a monitor that uses the 4:3 aspect ratio.
CR: Abbreviation of CROP. A video signal with the 4:3 aspect ratio is output, by cropping both the left and right sides of a video image with a 16:9 aspect ratio.
SQ: Abbreviation of SQUEEZE: A video signal of the image compressed horizontally is output so as to display the image without distortion on a monitor with a 16:9 aspect ratio.

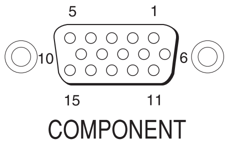
7 VISCA IN connector

8 VISCA OUT connector

9 SD OUT VIDEO connector

10 SD OUT S VIDEO connector

11 HD OUT COMPONENT connector

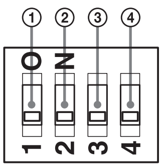


Pin No.	Function	
	At YPbPr COMPONENT setting (at SYNC)	At YPbPr COMPONENT setting (at VD)
0	Pr-OUT	Pr-OUT
1	Y-OUT	Y-OUT
2	Pb-OUT	Pb-OUT
3	GND	GND
4	GND	GND
5	GND	GND
6	GND	GND
7	GND	GND
8	GND	GND
9	No connection	No connection
10	GND	GND
11	GND	GND
12	No connection	No connection
13	HD-OUT	HD-OUT
14	Tri-level SYNC-OUT	Bi-level VD-OUT
15	No connection	No connection

12 HD OUT HD-SDI connector

13 IR SELECT switch

14 BOTTOM switches



① Switch 1 (infrared remote commander signal output switch)

Set to ON to enable output of the infrared signals, that are transmitted from the Remote Commander, from the VISCA IN connector, or set it to OFF to disable the output.

Note

Set IR ON/OFF before turning on the power. If you set IR ON/OFF after turning on the power, the setting is ignored.

② Switch 2 (Communication baud rate selector)
Set to ON for 38400 bps, or OFF for 9600 bps.

Note

Set the communication baud rate before turning on the power. If you set the communication baud rate after turning on the power, the setting is ignored.

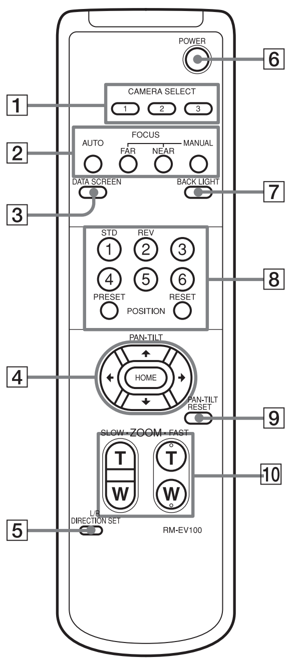
③ Switch 3 (Not used)
Be sure to set this switch to OFF.

④ Switch 4 (Not used)
Be sure to set this switch to OFF.

15 Tripod screw hole (1/4-20UNC)

16 Fixing screw holes (M3)

Remote Commander



1 CAMERA SELECT buttons
Press the button corresponding to the camera you want to operate with the Remote Commander.
The camera number can be set using the IR SELECT switch on the rear of the camera.

Note

If two or more cameras are adjacent and have the same camera number, they are operated simultaneously with the same Remote Commander. When you install the cameras close to each other, set different camera numbers.
For the camera number setting, see “Operating Multiple Cameras with the Remote Commander” described in the Operating Instructions supplied with the camera.

2 FOCUS buttons
Used for focus adjustment.
Press the AUTO button to adjust the focus automatically.
To adjust the focus manually, press the MANUAL button, and adjust it with the FAR and NEAR buttons.

3 DATA SCREEN button
Press this button to display the main menu. Press it again to turn off the menu. If you press the button when a lower-level menu is selected, the display goes back to a higher-level menu.

Note

Pan/tilt operations are disabled when the menu is displayed.

4 PAN-TILT buttons
Press the arrow buttons to perform panning and tilting.
Press the HOME button to face the camera back to the front.
When the menu is displayed, use ↑ or ↓ to select the menu items and ← or → to change the set values. The selected setting menu is displayed, by pressing the HOME button when the main menu is displayed.

5 L/R DIRECTION SET button
Hold down this button and press the REV button to change the direction of the camera movement opposite to that indicated by the arrow of the ←/→ buttons.
To reset the direction of the camera movement, press the STD button while holding down this button.

6 POWER switch
Press this button to turn on/off the camera when the camera is connected to an AC outlet.

7 BACK LIGHT button
Press this button to enable the backlight compensation.
Press it again to disable the backlight compensation.

8 POSITION buttons
Hold down the PRESET button and press button 1 to 6 to store the current camera direction, zooming, focus adjustment and backlight compensation in the memory of the pressed number button.
To erase the memory contents, hold down the RESET button and press button 1 to 6.

9 PAN-TILT RESET button
Press this button to reset the pan/tilt position.

10 ZOOM buttons
Use the SLOW button to zoom slowly, and the FAST button to zoom quickly.
Press the T (telephoto) side of the button to zoom in, and the W (wide angle) side to zoom out

Basic Functions

Zoom

The camera employs an 10× optical zoom lens combined with a digital zoom function allowing you to zoom up to 40×.

Lens specifications: Optical 10×, f = 3.4 to 33.9 mm (F1.8 to F2.1)

The horizontal angle of view is approximately 70 degrees (wide end) to 8 degrees (tele end).
Digital Zoom enlarges the center of the subject by expanding each image in both the vertical and horizontal directions. When 4× digital zoom is used, the number of effective picture elements in each direction reduces to 1/4 and the overall resolution deteriorates.

You can activate the zoom in the following two ways:

- **By pressing the T (tele) or W (wide) buttons on the Remote Commander.**
- **Using a VISCA Command**

  Using Standard Mode
  Using Variable Mode
  There are eight levels of zoom speed.
  Direct Mode
  Setting the zoom position enables quick movement to the designated position.

Focus

Focus has the following modes, all of which can be set using VISCA Commands.

- **Auto Focus Mode**
  The minimum focus distance is 100 mm at the optical wide end (extreme close-up settings with VISCA control) (distance from the front end of the lens).

- **Manual Focus Mode**
  MF (Manual Focus) has both a Standard Speed Mode and a Variable Speed Mode. Standard Speed Mode focuses at a fixed rate of speed. Variable Speed Mode has eight speed levels that can be set using a VISCA Command.

  To stop the required operation after sending a Standard Speed command or a Variable Speed command, send the Stop command.

- **One Push Trigger Mode**
  When a Trigger Command is received, the lens moves to adjust the focus for the subject. The focus lens then holds the same position until the next Trigger Command is input.
- **Infinity Mode**
  The lens is forcibly moved to a position suitable for an unlimited distance.
- **Near Limit Mode**
  Can be set in a range from about 3 m (2000) to 10 cm (7600).
  The focus range is narrowed by excluding the unnecessary range.

White Balance

White Balance has the following modes, all of which can be set using VISCA Commands.

- **Auto White Balance**
  This mode computes the white balance value output using color information from the entire screen. It outputs the proper value using the color temperature radiating from a black subject based on a range of values from 3000 to 7500K.
  This mode is the default setting.
- **Indoor**
  3200 K Base Mode
- **Outdoor**
  5800 K Base Mode
- **One Push WB**
  The One Push White Balance mode is a fixed white balance mode that may be automatically readjusted only at the request of the user (One Push Trigger), assuming that a white subject, in correct lighting conditions and occupying more than 1/2 of the image, is submitted to the camera.
  One Push White Balance data is lost when the power is turned off. If the power is turned off, reset the One Push White Balance.
- **Manual WB**
  Manual control of R and B gain, 256 steps each

Automatic Exposure Mode

The variety of AE functions, which allow video signal to output the optimum image for subjects from low light conditions to bright light conditions, are available.

- **Full Auto**
  Auto Iris and Gain, Fixed Shutter Speed (59.94/29.97/NTSC: 1/60 s, 50/25/PAL: 1/50 s)
- **Slow shutter limit**
  Lower limit of the slow shutter mode in the Full Auto mode. For the 59.94/29.97/NTSC video format, select the lower limit from among 1/60, 1/30 or 1/15.
  For the 50/25/PAL video format, select the lower limit from among 1/50, 1/25 or 1/12.
- **Shutter Priority** [1)]
  Variable Shutter Speed, Auto Iris and Gain (1/2 to 1/10,000 s, 21 steps, high speed shutter: 15 steps, slow shutter: 6 steps)
- **Iris Priority**
  Variable Iris (F1.8 to Close, 18 steps), Auto Gain and Shutter speed.
- **Manual**
  Variable Shutter, Iris and Gain.
- **Bright**
  Variable Iris and Gain (Close to F1.8, 18 steps at 0 dB: F1.8, 6 steps from 0 to 18 dB)
- **Spot light**
  Avoids a situation where the face of the subject is over-illuminated, and becomes whitish.

AE – Shutter Priority

The shutter speed can be set freely by the user to a total of 21 steps – 15 high speeds and 6 low speeds. When the slow shutter is set, the speed can be 1/30, 1/15, 1/8, or 1/4 s. The picture output is read at a normal rate from the memory. The memory is updated at a low rate from the CCD. AF capability is low.
In high speed mode, the shutter speed can be set up to 1/10,000 s. The iris and gain are set automatically, according to the brightness of the subject.

Parameter	59.94i	50i
	[sec]	[sec]
15	1/10000	1/10000
14	1/6000	1/6000
13	1/4000	1/3500
12	1/3000	1/2500
11	1/2000	1/1750
10	1/1500	1/1250
0F	1/1000	1/1000
0E	1/725	1/600
0D	1/500	1/425
0C	1/350	1/300
0B	1/250	1/215
0A	1/180	1/150
09	1/125	1/120
08	1/100	1/100
07	1/90	1/75
06	1/60	1/50
05	1/30	1/25
04	1/15	1/12
03	1/8	1/6
02	1/4	1/3
01	1/2	1/2

Note

When the low shutter speed is used, Auto Focus and White Balance may not function fully.

1) Flicker can be eliminated by setting shutter to:
→ 1/100 s for NTSC models used in countries with a 50 Hz power supply frequency.
→ 1/120 s for PAL models used in countries with a 60 Hz power supply frequency.

AE – Iris Priority

The iris can be set freely by the user to 18 steps between F1.8 and Close.
The gain and shutter speed are set automatically according to the brightness of the subject.

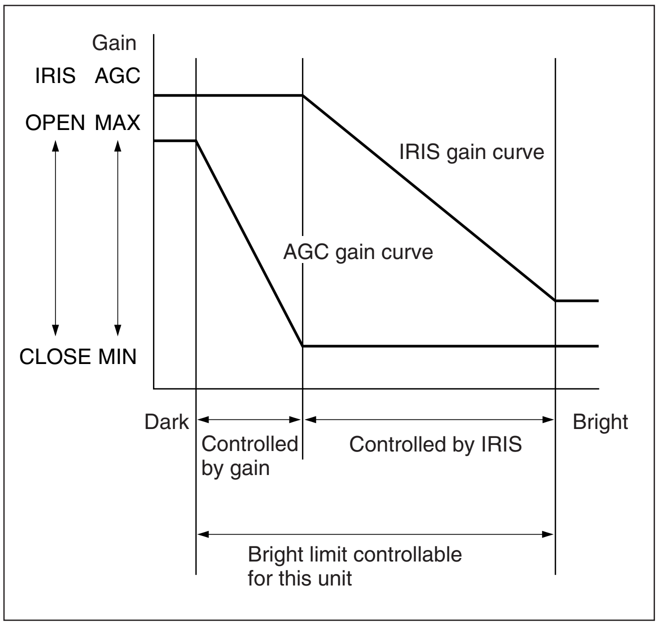
parameter	IRIS (F1.8) F No.	parameter	IRIS (F1.8) F No
11	F1.8	08	F8.0
10	F2.0	07	F9.6
0F	F2.4	06	F11
0E	F2.8	05	F14
0D	F3.4	04	F16
0C	F4.0	03	F19
0B	F4.8	02	F22
0A	F5.6	01	F26
09	F6.8	00	CLOSE

AE – Manual

The shutter speed (21 steps), iris (18 steps) and gain (8 steps) can be set freely by the user.

AE – Bright

The bright control function adjusts both the gain and iris using an internal algorithm according to a brightness level freely set by the user. Exposure is controlled by gain when dark and by iris when bright. As both gain and iris are fixed, this mode is used when exposing at a fixed camera sensitivity. When switching from Full Auto or Shutter Priority Mode to Bright Mode, the current status will be retained for a short period of time.
Only when the AE mode is set to "Full Auto" or "Shutter Priority," the user can switch it to "Bright."



Parameter	IRIS (F1.8) F No.	GAIN
17	F1.8	18dB
16	F1.8	15dB
15	F1.8	12dB
14	F1.8	9dB
13	F1.8	6dB
12	F1.8	3dB
11	F1.8	0dB
10	F2.0	0dB
0F	F2.4	0dB
0E	F2.8	0dB
0D	F3.4	0dB
0C	F4.0	0dB
0B	F4.8	0dB
0A	F5.6	0dB
09	F6.8	0dB
08	F8.0	0dB
07	F9.6	0dB
06	F11	0dB
05	F14	0dB
04	F16	0dB
03	F19	0dB
02	F22	0dB
01	F26	0dB
00	CLOSE	0dB

When switching from the Shutter Priority mode to the Bright mode, the shutter speed set in the Shutter Priority mode is maintained.

Exposure Compensation

Exposure compensation is a function which offsets the internal reference brightness level used in the AE mode by steps of 1.5 dB.

EXPOSURE	Comp Value	Step
0E	+10.5dB	+7
0D	+9dB	+6
0C	+7.5dB	+5
0B	+6dB	+4
0A	+4.5dB	+3
09	+3dB	+2
08	+1.5dB	+1
07	0dB	0
06	–1.5dB	–1
05	–3dB	–2
04	–4.5dB	–3
03	–6dB	–4
02	–7.5dB	–5
01	–9dB	–6
00	–10.5dB	–7

Aperture Control

Aperture control is a function which adjusts the enhancement of the edges of objects in the picture. There are 16 levels of adjustment, starting from “no enhancement.” When shooting text, this control may help by making the text sharper.

Back Light Compensation

When the background of the subject is too bright, or when the subject is too dark due to shooting in the AE mode, back light compensation will make the subject appear clearer.

Camera ID

The ID can be set up to 65,536 (0000 to FFFF). As this will be memorized in the nonvolatile memory inside the camera, data will be saved, regardless of the “position preset.”

Effect

It consists of the following functions.
• **Neg. Art:** Negative/Positive Reversal
• **Black White:** Monochrome Image

Checking the Location of the Camera for Signals from the IR Remote Commander

The supplied Remote Commander may not work correctly near inverter lighting fixtures. In such a case, the camera is probably installed in a place where it cannot detect the infrared signals from the Remote Commander.
While the camera is being initialized after the power is turned on by connecting the camera to an AC outlet using the AC power adaptor and AC power cord, or by using a VISCA command, the camera detects whether or not the camera is able to receive infrared signals from the Remote Commander. You can check the result of this operation via the IR_ConditionInq command (see page 30).

When the installation location does not allow stable reception, try to install the camera farther away from the inverter lighting fixtures.

Others

Power On/Off
Powers the camera on and off. When the power is off, the camera is able to accept only the lowest level of VISCA Commands and POWER of the Remote Commander; the display and other features are turned off.

I/F clear
Clears the Command buffer of the camera. Clearing the buffer can also be carried out from the control application software when the power is on.

Address set
VISCA is a protocol, which normally can support a daisy chain of up to seven attached devices. Therefore, whenever a camera is connected for the first time, be sure to use the address set to confirm the address.

Memory (Position Preset)

Using the position preset function, 6 sets of camera shooting conditions can be stored and recalled.
This function allows you to achieve the desired status instantly even without adjusting the following items each time:

- **Pan-Tilt position**
- **Zoom Position**
- **Focus Auto/Manual**
- **Focus Position**
- **AE Mode**
- **Shutter control parameters**
- **Bright Control**
- **Iris control parameters**
- **Gain control parameters**
- **Exposure Compensation On/Off**
- **Exposure Level**
- **Backlight Compensation On/Off**
- **White Balance Mode**
- **R/B Gain**
- **Aperture**

The settings are recalled when the power is turned on.

For setting items, see the "Initial Settings, Position Preset" section on page 13.

Note

When you turn the camera to the right or left beyond the 45° with the camera pointed downward by 25°, the camera may be caught on the lens, depending on the zoom position of the lens.

Initial Settings and Position Preset

The initial values are those set at the factory. Settings for items in Position presets 1 to 6 that will be retained even when the power to the camera is turned off are indicated by a "O," those that will be lost are indicated by an "X."

- When the power is turned on, the settings retained in POSITION 1 will be called up as the initial settings.
- When a CAM_Memory Reset command is sent, or a choice is made from POSITION 1 to 6 while the RESET button on the Remote Commander is being pressed, the settings selected will be used as the initial settings.
- Position preset 1 becomes VISCA command CAM_Memory memory number 0. Position presets 2 through 6 become VISCA command CAM_Memory memory numbers 1 through 5.

Category	Mode/Position	Initial settings	Position preset 1	Position presets 2 to 6
Pan/Tilt	Pan/Tilt Position	Home position	○	○
	Pan/Tilt Limit Position	movable-range maximum	○	×
Zoom	Zoom Position	Wide end	○	○
	D-Zoom Limit	x4	○	○
Focus	Focus Position	—	○	○
	Focus Auto/Manual	Auto	○	○
	Near Limit Setting	7600h (10 cm)	○	×
WB	WB Mode	Auto	○	○
	WB Data (Rgain, Bgain)	—	○	○
	One Push WB Data	—	○	×
AE	AE Mode	Full Auto	○	○
	AutoSlowShutterLimite	1/60sec (59.94/29.97/NTSC), 1/50sec (50/25/PAL)	○	○
	Shutter Position	1/60sec (59.94/29.97/NTSC), 1/50sec (50/25/PAL)	○	○
	Iris Position	—	○	○
	Gain Position	—	○	○
	Bright Position	—	○	○
	Exposure Compensation On/Off	Off	○	○
	Exposure Compensation Amount	±0	○	○
	Backlight On/Off	Off	○	○
Apperture	Aperture Level	8	○	○
IR	IR_Receive On/Off	On	○	×
	IR_ReceiveReturn On/Off	Off	○	×
OSD	Display Information On/Off	On	○	×
Effect	Picture Effect	Off	○	×
System	D-SUB 15Pin SYNC	3-STATE	○	×
Memroy	Preset Memory	Same as the initial value setting	○	○

Notes

- The number of times data can be written to the EEPROM (by executing Position Preset) is limited.
- If you want the camera status and Pan/Tilt positions in effect before the camera is turned off to be retained when the power is turned OFF, then turned ON again, have the camera memorize those positions in POSITION 1.
- It takes approximately 2 seconds longer to memorize or erase settings in POSITION 1 than it does to memorize or erase settings in any other channel.
- Camera ID data will be saved regardless of the position preset.

Mode Condition

Basic settings

Command \ Mode	Power Off[1]	Power On				
		IFC[2]	Initializing[3]	During displaying the menu	Other Status	Memory Command
Address Set	○	○	○	○	○	○
IF_Clear	○	○	○	○	○	○
CAM_Power On	○	×	×	○	○	×
CAM_Power Off	○	×	×	○	○	×
IR_Receive On/Off	×	×	×	○[4]	○	×
IR_ReceiveReturn On/Off	×	×	×	○	○	×
CAM Version Inq	○	○	○	○	○	○
CAM_Power Inq.	○	○	○	○	○	○
BlockInquiry	×	×	×	○	○	×
InquiryCommand (and similar commands)	×	×	×	○	○	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) The camera does not receive the operation sent from the Remote Commander.

Zoom/Focus

Mode / Command	Power Off[1]	Power On						
		IFC[2]	Initializing[3]	Zoom Direct	Focus Direct	AF ON	During displaying the menu	Memory Recall
CAM_Zoom Tele/Wide/Stop [VISCA]	×	×	×	×	○	○	×[4]	×
CAM_Zoom Tele/Wide/Stop [RC]	×	×	×	×	○	○	×[4]	×
CAM_Zoom Direct	×	×	×	○	○	○	×[4]	×
D-Zoom Limit	×	×	×	×	○	○	×[4]	×
CAM_Focus Far/Near/Stop [VISCA]	×	×	×	○	×	×	×[4]	×
CAM_Focus Far/Near/Stop [RC]	×	×	×	○	×	×	×[4]	×
CAM_Focus Direct	×	×	×	○	○	×	×[4]	×
CAM_Focus Mode (Auto/Manual)	×	×	×	○	×	○	×[4]	×
CAM_Focus One Push Trigger	×	×	×	○	×	×	×[4]	×
CAM_Focus Infinity	×	×	×	○	×	○	×[4]	×
CAM_Focus Near Limit	×	×	×	○	×	○	×[4]	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) The camera is not limited in operation due to the menus. But the camera follows the operational restrictions of the current mode while the camera is receiving the command in each mode.

White Balance

Mode / Command	Power Off[1]	Power On								
		IFC[2]	Initializing[3]	White balance mode					During displaying the menu	Memory Recall
				Auto	Indoor	Outdoor	One Push	Manual		
CAM_WB Auto/Indoor/Outdoor/ OnePhshWB/Manual	×	×	×	○	○	○	○	○	×[4]	×
CAM_WB One Push Trigger	×	×	×	×	×	×	○[5]	×	×[4]	×
CAM_WB R(B) Gain Reset/Up/Down/Direct	×	×	×	×	×	×	×	○	×[4]	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) The camera is not limited in operation due to the menus. But the camera follows the operational restrictions of the current mode during IFC executing/initializing/white balance mode operation.
5) Commands are ignored during a One Push AWB operation.

Exposure

Command \ Mode	Power Off[1]	Power Off									
		IFC[2]	Initializing[3]	Exposure mode						During displaying the menu	Memory Recall
				Full Auto	Bright	Shutter Pri	Iris Pri	SPOT Light	Manual		
CAM_AE Full Auto/Manual/Shutter Pri/ Iris Pri/Bright/Spot Light	×	×	×	○	○[4]	○	○	○	○	×[5]	×
CAM_AE Bright	×	×	×	○	○	○	×	×	×	×[5]	×
CAM_Slow Shutter Limit ON/OFF	×	×	×	○	○	○	○	○	○	×[5]	×
CAM_Shutter Reset/Up/Down/Direct[6]	×	×	×	×	×	○	×	×	○	×[5]	×
CAM_Iris Reset/Up/Down/Direct	×	×	×	×	×	×	○	×	○	×[5]	×
CAM_Gain Reset/Up/Down/Direct	×	×	×	×	×	×	×	×	○	×[5]	×
CAM_Bright Reset/Up/Down/Direct	×	×	×	×	○	×	×	×	×	×[5]	×
CAM_ExComp On/Off	×	×	×	○	○	○	○	○	○	×[5]	×
CAM_ExComp Reset/Up/Down/Direct[7]	×	×	×	○	○	○	○	○	○	×[5]	×
CAM_Backlight On/Off	×	×	×	○	×	×	×	○	×	×[5]	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) ○: Only when the camera changes to BRIGHT mode from Full Auto or SHUTTER Pri mode.
5) The camera is not limited in operation due to the menus. But the camera follows the operational restrictions of the current mode during IFC executing/initializing/exposure mode operation.
6) You are not allowed to adjust the slow shutter setting while using Digital Effect.
7) ×: This is not allowed when EX-COMP is set to OFF.

Effect

Mode / Command	Power Off[1]	Power On					
		IFC[2]	Initializing[3]	Slow Shutter Status	Picture Effect ON	During displaying the menu	Memory Recall
CAM_Aperture Reset/Up/Down/Direct	×	×	×	○	○	×[4]	×
CAM_PictureEffect Off/Nega/B&W	×	×	×	○	○	×[4]	×
Display info. (ON/OFF)	×	×	×	○	○	×[4]	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) The camera is not limited in operation due to the menus. But the camera follows the operational restrictions of the current mode during IFC executing/initializing/slow shutter mode/Effect On.

Pan/Tilt

Command	Transmit device (Mode)	Power Off[1]	Power On: IFC[2]	Initia-lizing[3]	Zoom (Direct) Common	Focus (Direct) Common	Pan/Tilt normal status: Pan/tilt movement according to the command VISCA	Pan/tilt movement according to the command RC	Absolute Position execution VISCA	Relative Position execution VISCA	Home execution VISCA	Home execution RC	Reset execution VISCA	Reset execution RC	Memory Recall VISCA	Memory Recall RC	During displaying the menu	Position detection error
Pan-tiltDrive Up/Down/Left/Right/UpLeft/UpRight/DownLeft/DownRight	VISCA	×	×	×	○	○	○	○	×	×	×	×	×	×	×	×	×	○
	RC	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×	○
Pan-tiltDrive Stop	VISCA	×	×	×	○	○	○	×	×	×	×	×	×	×	×	×	×	○
Pan-tiltDrive AbsolutePosition	VISCA	×	×	×	○	○	○	○	○	×	×	×	×	×	×	×	×[5]	×
Pan-tiltDrive RelativePosition	VISCA	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×[5]	○
Pan-tiltDrive Home	VISCA	×	×	×	○	○	×	×	×	×	○	×	×	×	×	×	×	×
	RC	×	×	×	○	○	×	×	×	×	×	○	×	×	×	×	×	×
Pan-tiltDrive Reset	VISCA	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×[5]	○
	RC	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×[5]	○
Pan-tiltLimitSet LimitSet	VISCA	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×[5]	×
Pan-tiltLimitSet LimitClear	VISCA	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×[5]	×
Memory Set	Common	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×[5]	×
Memory Reset	Common	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×[5]	×
Memory Recall	VISCA	×	×	×	×[6]	×[7]	○	○	×	×	×	×	×	×	○	○	×[5]	×
	RC	×	×	×	×[6]	×[7]	○	×	×	×	×	×	×	×	○	○	×[5]	×

1) DC power is being supplied, but the camera has been turned off by a VISCA command.
2) The period from the time IF Clear is sent, until the Reply Packet is returned.
3) The period from the time DC power is turned on or the camera is turned on via a VISCA command, and the camera subsequently finishes the pan/tilt reset operation and stops at the Home position, until the video signal is output. Or the period from the time the CAM Power ON command is sent, until Completion is returned.
4) The pan/tilt operation works by Pan-tiltDrive Up/Down/Left/Right/UpLeft/UpRight/DownLeft/DownRight commands.
5) The camera follows the operational restrictions of the mode in effect during zoom/focus or pan/tilt operations.
6) ○: while the camera operates in Tele/Wide zoom mode.
7) ○: while the camera operates in Far/Near focus mode.

Command List

VISCA[1] RS-232C Commands

Use of RS-232C control software which has been developed based upon this command list may cause malfunction or damage to hardware and software. Sony Corporation is not liable for any such damage.

Overview of VISCA

In VISCA, the side outputting commands, for example, a computer, is called the controller, while the side receiving the commands, such as an EVI-HD1, is called the peripheral device. The EVI-HD1 serves as a peripheral device in VISCA. In VISCA, up to seven peripheral devices like the EVI-HD1 can be connected to one controller using communication conforming to the RS-232C standard. The parameters of RS-232C are as follows.

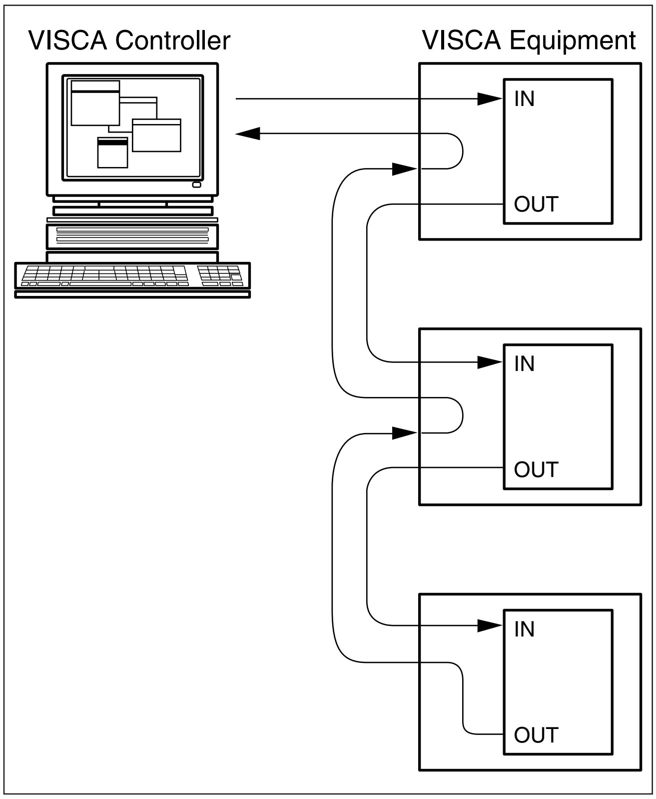
- Communication speed: 9600 bps/38400 bps
- Data bits : 8
- Start bit : 1
- Stop bit : 1
- Non parity

Flow control using XON/XOFF and RTS/CTS, etc., is not supported.

Peripheral devices are connected in a daisy chain. As shown in Fig. 1, the actual internal connection is a one-direction ring, so that messages return to the controller via the peripheral devices. The devices on the network are assigned addresses.
The address of the controller is fixed at 0. The addresses of the peripheral devices are 1, 2, 3 ... in order, starting from the one nearest the controller. The address of the peripheral device is set by sending address commands during the initialization of the network.

The VISCA devices each have a VISCA IN and VISCA OUT connector.
Set the DTR input (the S output of the controller) of VISCA IN to H when controlling VISCA equipment from the controller.

Fig. 1 VISCA network configuration



1) VISCA is a protocol which controls consumer camcorders developed by Sony. “VISCA” is a trademark of Sony Corporation.

VISCA Communication Specifications

VISCA packet structure

The basic unit of VISCA communication is called a packet (Fig. 2). The first byte of the packet is called the header and comprises the sender's and receiver's addresses. For example, the header of the packet sent to the EVI-HD1 assigned address 1 from the controller (address 0) is hexadecimal 81H. The packet sent to the

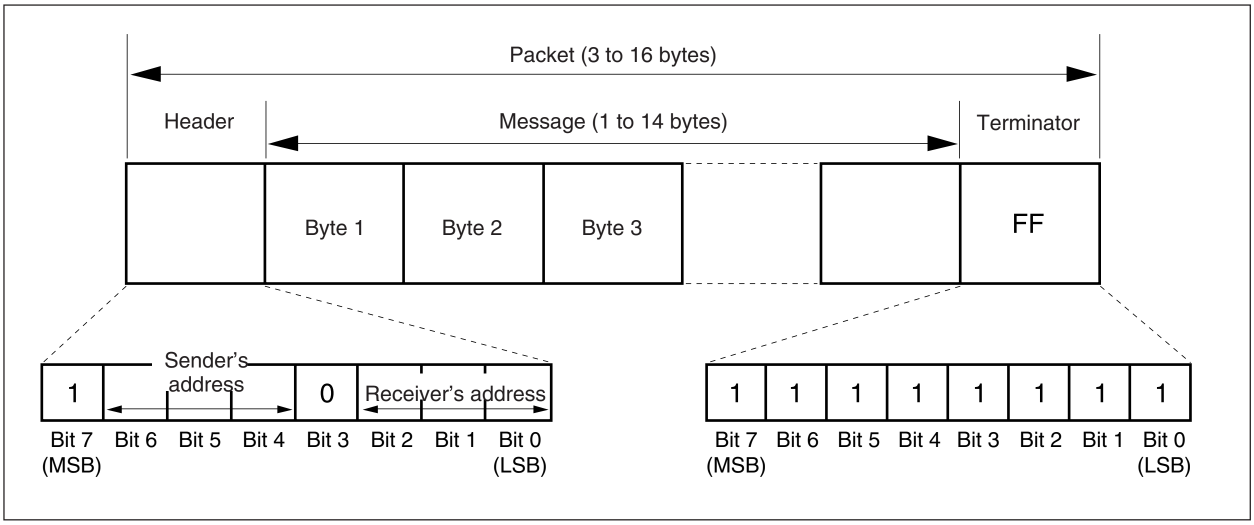


Fig. 2 Packet structure

Note

Fig. 2 shows the packet structure, while Fig. 3 shows the actual waveform. Data flow will take place with the LSB first.

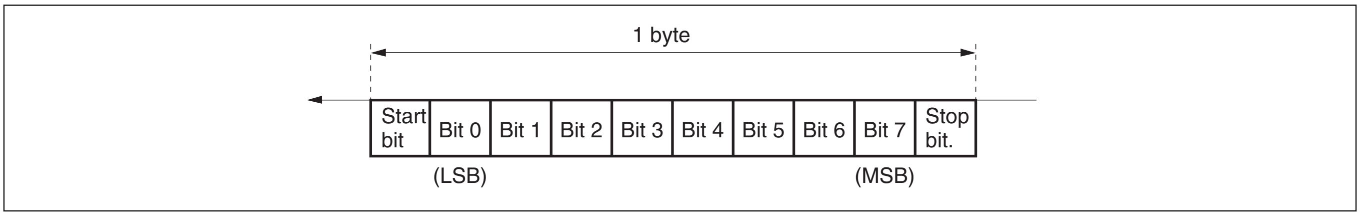
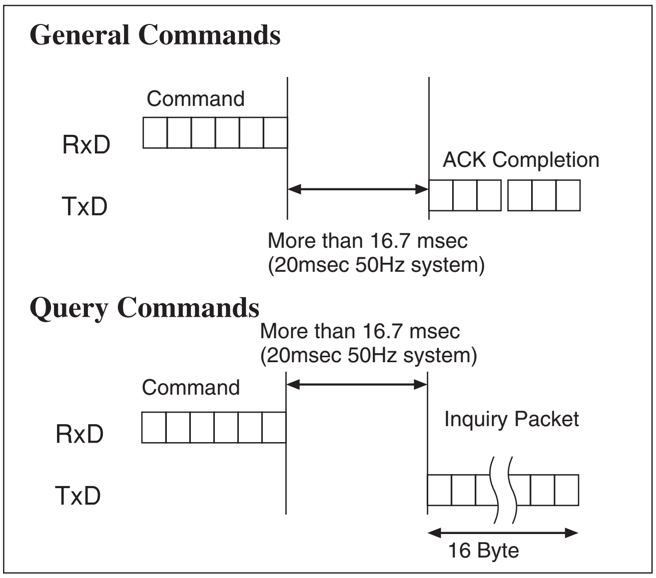


Fig. 3 Actual waveform for 1 byte.

Timing Chart

As VISCA Command processing can only be carried out one time in a Vertical cycle, it takes the maximum 1V cycle time for an ACK/Completion to be returned. If the Command ACK/Completion communication time can be cut shorter than the 1V cycle time, then every 1V cycle can receive a Command.
From this point, if 2 or more commands in a row are to be sent, wait for the first command (for normal commands, an ACK or an error message, for query commands, an Inquiry Packet) to be carried out before sending the next one.



Command and inquiry

- **Command**
  Sends operational commands to the EVI-HD1.
- **Inquiry**
  Used for inquiring about the current state of the EVI-HD1.

	Command Packet	Note
Inquiry	8X QQ RR ... FF	QQ[1)] = Command/Inquiry, RR[2)] = category code

1) QQ = 01 (Command), 09 (Inquiry)
2) RR = 00 (Interface), 04 (camera 1), 06 (Pan/Tilter)

X = 1 to 7: EVI-HD1 address

Responses for commands and inquiries

- **ACK message**
  Returned by the EVI-HD1 when it receives a command. No ACK message is returned for inquiries.

- **Completion message**
  Returned by the EVI-HD1 when execution of commands or inquiries is completed. In the case of inquiry commands, it will contain reply data for the inquiry after the 3rd byte of the packet. If the ACK message is omitted, the socket number will contain a 0.

	Reply Packet	Note
Ack	X0 4Y FF	Y = socket number
Completion (commands)	X0 5Y FF	Y = socket number
Completion (Inquiries)	X0 5Y ... FF	Y = socket number

X = 9 to F: EVI-HD1 address + 8

- **Error message**
  When a command or inquiry command could not be executed or failed, an error message is returned instead of the completion message.

Error Packet	Description
X0 6Y 02 FF	Syntax Error
X0 6Y 03 FF	Command buffer full
X0 6Y 04 FF	Command cancelled
X0 6Y 05 FF	No socket (to be cancelled)
X0 6Y 41 FF	Command not executable

X = 9 to F: EVI-HD1 address + 8, Y = socket number

Socket number

When command messages are sent to the EVI-HD1, it is normal to send the next command message after waiting for the completion message or error message to return. However to deal with advanced uses, the EVI-HD1 has two buffers (memories) for commands, so that up to two commands including the commands currently being executed can be received. When the EVI-HD1 receives commands, it notifies the sender which command buffer was used using the socket number of the ACK message.
As the completion message or error message also has a socket number, it indicates which command has ended. Even when two command buffers are being used at any one time, an EVI-HD1 management command and some inquiry messages can be executed.
The ACK message is not returned for these commands and inquiries, and only the completion message of socket number 0 is returned.

Command execution cancel

To cancel a command which has already been sent, send the Cancel command as the next command. To cancel one of any two commands which have been sent, use the cancel message.

	Cancel Packet	Note
Cancel	8X 2Y FF	Y = socket number

X = 1 to 7: EVI-HD1 address, Y = socket number

The Command canceled error message will be returned for this command, but this is not a fault. It indicates that the command has been canceled.

VISCA Device Setting Command

Before starting control of the EVI-HD1, be sure to send the Address command and the IF_Clear command using the broadcast function.

For VISCA network administration

● **Address**
Sets an address of a peripheral device. Use when initializing the network, and receiving the following network change message.

● **Network Change**
Sent from the peripheral device to the controller when a device is removed from or added to the network. The address must be re-set when this message is received.

	Packet	Note
Address	88 30 01 FF	Always broadcasted.
Network Change	X0 38 FF	

X = 9 to F: EVI-HD1 address + 8

VISCA interface command

● **IF_Clear**
Clears the command buffers in the EVI-HD1 and cancels the command currently being executed.

	Command Packet	Reply Packet	Note
IF_Clear	8X 01 00 01FF	X0 50 FF	
IF_Clear (broadcast)	88 01 00 01 FF	88 01 00 01 FF	

X = 1 to 7: EVI-HD1 address (For inquiry packet)
X = 9 to F: EVI-HD1 address +8 (For reply packet)

VISCA interface and inquiry

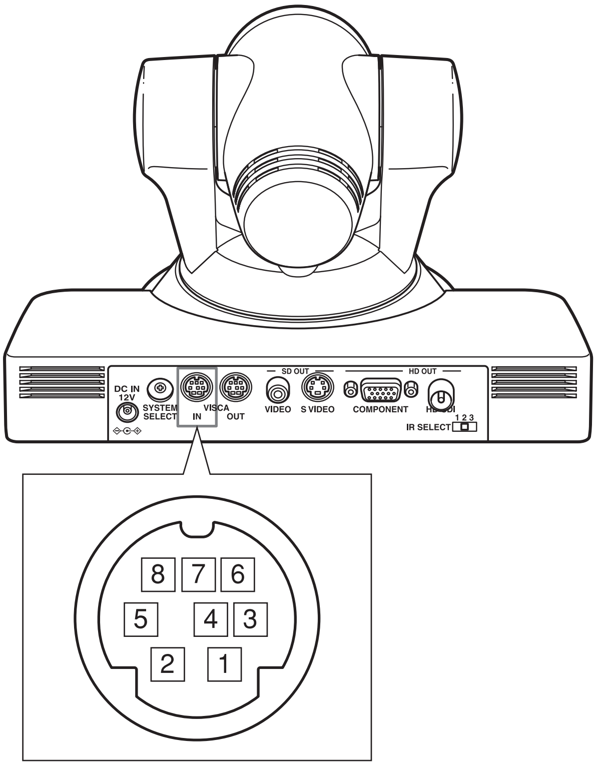
● **CAM_VersionInq**
Returns information on the VISCA interface.

Inquiry	Inquiry Packet	Reply Packet	Description
CAM_VersionInq	8X 09 00 02 FF	Y0 50 GG GG HH HH JJ JJ KK FF	GGGG = Vender ID (0010: Sony) HHHH = Model ID 0504: EVI-HD1 JJJJ = ROM revision KK = Maximum socket # (02)

X = 1 to 7: EVI-HD1 address (For inquiry packet)
X = 9 to F: EVI-HD1 address +8 (For reply packet)

Pin assignment

VISCA IN connector (mini-DIN 8-pin, female)



VISCA IN

No	Pins
1	DTR IN
2	DSR IN
3	TXD IN
4	GND
5	RXD IN
6	GND
7	IR OUT (R)*
8	IR OUT (L)*

* You can change ON/OFF of IR OUT of pins 7 and 8 using the BOTTOM switch (see page 6).

- EVI-HD1 / Windows D-sub 9 pin

EVI-HD1	Windows D-sub 9 pin
1. DTR	1. CD
2. DSR	2. RXD
3. TXD	3. TXD
4. GND	4. DTR
5. RXD	5. GND
6. GND	6. DSR
7. IR OUT(R)	7. RTS
8. IR OUT(L)	8. CTS
	9. RI

- EVI-HD1 / EVI Camera or Mini DIN 8 pin serial

EVI-HD1	EVI Camera or Mini DIN 8 pin serial
1. DTR	1. DTR
2. DSR	2. DSR
3. TXD	3. TXD
4. GND	4. GND
5. RXD	5. RXD
6. GND	6. GND
7. IR OUT(R)	7. OPEN
8. IR OUT(L)	8. OPEN

- EVI-HD1 / Windows D-sub 25 pin

EVI-HD1	Windows D-sub 25 pin
1. DTR	1. FG
2. DSR	2. TXD
3. TXD	3. RXD
4. GND	4. RTS
5. RXD	5. CTS
6. GND	6. DSR
7. IR OUT(R)	7. GND
8. IR OUT(L)	20. DTR

VISCA Command/ACK Protocol

Command	Command Message	Reply Message	Comments
General Command	81 01 04 38 02 FF (Example)	90 41 FF (ACK)+90 51 FF (Completion) 90 42 FF 90 52 FF	Returns ACK when a command has been accepted, and Completion when a command has been executed.
	81 01 04 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted a command which is not supported or a command lacking parameters.
	81 01 04 38 02 FF (Example)	90 60 03 FF (Command Buffer Full)	There are two commands currently being executed, and the command could not be accepted.
	81 01 04 08 02 FF (Example)	90 61 41 FF (Command Not Executable) 90 62 41FF	Could not execute the command in the current mode.
Inquiry Command	81 09 04 38 FF (Example)	90 50 02 FF (Completion)	ACK is not returned for the inquiry command.
	81 09 05 38 FF (Example)	90 60 02 FF (Syntax Error)	Accepted an incompatible command.
Address Set	88 30 01 FF	88 30 02 FF	Returned the device address to +1.
IF_Clear(Broadcast)	88 01 00 01 FF	88 01 00 01 FF	Returned the same command.
IF_Clear (For x)	8x 01 00 01 FF	z0 50 FF (Completion)	ACK is not returned for this command.
Command Cancel	8x 2y FF	z0 6y 04 FF (Command Canceled)	Returned when the command of the socket specified is canceled. Completion for the command canceled is not returned.
		z0 6y 05 FF (No Socket)	Returned when the command of the specified socket has already been completed or when the socket number specified is wrong.

VISCA Camera-Issued Messages

ACK/Completion Messages

	Command Messages	Comments
ACK	z0 4y FF (y:Socket No.)	Returned when the command is accepted.
Completion	z0 5y FF (y:Socket No.)	Returned when the command has been executed.

z = Device address + 8

Error Messages

	Command Messages	Comments
Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.
Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
Command Canceled	z0 6y 04 FF (y:Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.
No Socket	z0 6y 05 FF (y:Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.
Command Not Executable	z0 6y 41 FF (y:Execution command Socket No. Inquiry command:0)	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

Network Change Message

	Command Message	Comments
Network Change	z0 38 FF	Issued when power is being routed to the camera, or when the VISCA device is connected to or disconnected from the VISCA OUT connector.

EVI-HD1 Commands

EVI-HD1 Command List (1/3)

Command Set	Command	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CommandCancel		8x 2p FF	p: Socket No.(=1or2)
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	p=0 (Low) to 7 (High)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_DZoom	D-Zoom Limit	8x 01 04 26 0p FF	p=0 (x1), 1 (x1.5), 2 (x2), 3 (x4)
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	p=0 (Low) to 7 (High)
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF ON/OFF
	Manual Focus	8x 01 04 38 03 FF	
	Auto/Manual	8x 01 04 38 10 FF	
	One Push Trigger	8x 01 04 18 01 FF	One Push AF Trigger
	Infinity	8x 01 04 18 02 FF	Forced infinity
	Near Limit	8x 01 04 28 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	One Push WB	8x 01 04 35 03 FF	One Push WB mode
	Manual	8x 01 04 35 05 FF	Manual Control mode
	One Push Trigger [1)]	8x 01 04 10 05 FF	One Push WB Trigger
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain

EVI-HD1 Command List (2/3)

Command Set	Command	Command Packet	Comments
CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter Priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris Priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright [2)]	8x 01 04 39 0D FF	Bright Mode (Manual control)
	CAM SpotLight	8x 01 04 39 10 FF	Spot light mode
CAM_SlowShutter	AutoSlowShutterLimit	8x 01 04 2A 0p 00 FF	59.94 Hz system: p = 0 (1/60), 1 (1/30), 2 (1/15), 50 Hz system: p = 0 (1/50), 1 (1/25), 2 (1/12)
CAM_Shutter	Reset	8x 01 04 0A 00 FF	Shutter Setting
	Up	8x 01 04 0A 02 FF	
	Down	8x 01 04 0A 03 FF	
	Direct	8x 01 04 4A 00 00 0p 0q FF	pq: Shutter Position
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 4C 00 00 0p 0q FF	pq: Gain Position
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright Setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 4D 00 00 0p 0q FF	pq: Bright Position
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation ON/OFF
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	pq: ExpComp Position
CAM_Backlight	On	8x 01 04 33 02 FF	Back Light Compensation ON/OFF
	Off	8x 01 04 33 03 FF	
CAM_Aperture	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	Neg.Art	8x 01 04 63 02 FF	
	B&W	8x 01 04 63 04 FF	
CAM_Memory	Reset [3)]	8x 01 04 3F 00 0p FF	p: Memory Number (=0 to 5) Corresponds to 1 to 6 on the Remote Commander.
	Set [3)]	8x 01 04 3F 01 0p FF	
	Recall [3), 4)]	8x 01 04 3F 02 0p FF	
SYS_Menu	Off	8x 01 06 06 03 FF	Turns off the menu screen.

EVI-HD1 Command List (3/3)

Command Set	Command	Command Packet	Comments
CAM_IDWrite		8x 01 04 22 0p 0q 0r 0s FF	pqrs: Camera ID (=0000 to FFFF)
IR_Receive	On	8x 01 06 08 02 FF	IR(remote commander) receive ON/OFF
	Off	8x 01 06 08 03 FF	
	On/Off	8x 01 06 08 10 FF	
IR_ReceiveReturn	On	8x 01 7D 01 03 00 00 FF	IR (remote commander) receive message via the VISCA communication ON/OFF
	Off	8x 01 7D 01 13 00 00 FF	For contents of messages, see page 30.
D-SUB 15Pin SYNC	3-STATE	8x 01 7E 01 1A 00 00 FF	Setting the sync of the HD analog component output
	VD	8x 01 7E 01 1A 00 01 FF	
Information Display	On	8x 01 7E 01 18 02 FF	ON/OFF of the Operation status display of One Push
	Off	8x 01 7E 01 18 03 FF	Trigger of CAM_Memory and CAM_WB
Pan-tiltDrive	Up [3)]	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0 x01 (low speed) to 0 x18 (high speed)
	Down [3)]	8x 01 06 01 VV WW 03 02 FF	WW: Tilt Speed 0 x 01 (low speed) to 0 x14 (high speed)
	Left [3)]	8x 01 06 01 VV WW 01 03 FF	YYYY: Pan Position FA60 to 05A0 (center 0000)
	Right [3)]	8x 01 06 01 VV WW 02 03 FF	ZZZZ: Tilt Position FE98 to 0168 (center 0000)
	UpLeft [3)]	8x 01 06 01 VV WW 01 01 FF	
	UpRight [3)]	8x 01 06 01 VV WW 02 01 FF	See page 37.
	DownLeft [3)]	8x 01 06 01 VV WW 01 02 FF	
	DownRight [3)]	8x 01 06 01 VV WW 02 02 FF	
	Stop [3)]	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan-tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position FA60 to 05A0 (center 0000)
	LimitClear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	ZZZZ: Tilt Position FE98~0168 (center 0000)

1) After an ACK to a One Push White Balance Trigger is sent until the operation is completed, “Not Executable” is sent as a reply when any other commands are received.
When a slow shutter speed (1/20, 1/25 or lower) is selected, the time needed for the One Push White Balance adjustment will be longer.
2) Bright can be set only in Full Auto mode or Shutter Priority mode.
3) When the menu is displayed, this operation is ignored.
4) When other commands are received after a Completion notification for the Recall command is sent, “Command not executable” may be returned for a maximum of 240 msec due to internal processing. In this case, please transmit the command again.

EVI-HD1 Inquiry Command List (1/2)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off (Standby)
		y0 50 04 FF	Internal power circuit error
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_DZoomLimitInq	8x 09 04 26 FF	y0 50 0p FF	p= 2 (x1), 1 (x1/5), 2 (x2), 3 (x4)
CAM_FocusModeInq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_FocusNearLimitInq	8x 09 04 28 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Near Limit Position
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	In Door
		y0 50 02 FF	Out Door
		y0 50 03 FF	One Push WB
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter Priority
		y0 50 0B FF	Iris Priority
		y0 50 0D FF	Bright
		y0 50 10 FF	Spot Light
CAM_AutoSlowShutterLimitInq	8x 09 04 2A FF	y0 50 0p 00 FF	59.94 Hz system: p = 0 (1/60), 1 (1/30), 2 (1/15), 50 Hz system: p = 0 (1/50), 1 (1/25), 2 (1/12)
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_GainPosInq	8x 09 04 4C FF	y0 50 00 00 0p 0q FF	pq: Gain Position
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BacklightModeInq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ApertureInq	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffectModeInq	8x 09 04 63 FF	y0 50 00 FF	Off
		y0 50 02 FF	Neg.Art
		y0 50 04 FF	B&W
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuModeInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID

EVI-HD1 Inquiry Command List (2/2)

Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_VersionInq	8x 09 00 02 FF	y0 50 00 01 mn pq rs tu vw FF	mnpq: Model Code (0504) rstu: ROM version vw: Socket Number (=02) See page 21.
D-SUB 15Pin SYNC	8x 09 7E 01 1A FF	y0 50 00 FF	3-STATE
		y0 50 01 FF	VD
Information Display	8x 09 7E 01 18 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
VideoSystemInq	8x 09 06 23 FF		Video format / Output connetor
		y0 50 00 FF	1920 x1080i/59.94 / 59.94 Hz system / 15P Dsub, HD-SD
		y0 50 01 FF	1920 x1080p/29.97
		y0 50 02 FF	1280 x720p/59.94
		y0 50 03 FF	1280 x720p/29.97
		y0 50 04 FF	NTSC Letter Box / RCA phono Mini DIN 4-pin
		y0 50 05 FF	NTSC Crop
		y0 50 06 FF	NTSC Squeeze
		y0 50 08 FF	1920 x1080i/50 / 50 Hz system / 15P Dsub, HD-SDI
		y0 50 09 FF	1920 x1080p/25
		y0 50 0A FF	1280 x720p/50
		y0 50 0B FF	1280 x 720p/25
		y0 50 0C FF	PAL Letter Box / RCA phono Mini DIN 4-pin
		y0 50 0D FF	PAL Crop
		y0 50 0E FF	PAL Squeeze
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
IR_ReceiveReturn		y0 07 7D 01 04 00 FF	Power ON/OFF
		y0 07 7D 01 04 07 FF	Zoom tele/wide
		y0 07 7D 01 04 38 FF	AF On/Off
		y0 07 7D 01 04 33 FF	CAM_Backlight
		y0 07 7D 01 04 3F FF	CAM_Memory
		y0 07 7D 01 06 01 FF	Pan_tiltDrive
IR_ConditionInq	8x 09 06 34 FF	y0 50 00 FF	Stable reception from the IR Remote Commander
		y0 50 01 FF	Unstable reception from the IR Remote Commander
		y0 50 02 FF	Impossible to detect the infrared signals from the Remote Commander because the camera is turned on by the Remote Commander.
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww = Pan Max Speed zz = Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	wwww = Pan Position zzzz = Tilt Position See page 37.
Pan-tiltModeInq	8x 09 06 10 FF	y0 50 pq rs FF	pqrs: Pan/Tilt Status See page 37.

EVI-HD1 Block Inquiry Command List

Lens control system inquiry commands ....Command Packet 8x 09 7E 7E 00 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (HH)
	2	
	1	
	0	
3	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (HL)
	2	
	1	
	0	
4	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (LH)
	2	
	1	
	0	
5	7	0
	6	0
	5	0
	4	0
	3	Zoom Position (LL)
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	Focus Near Limit (H)
	2	
	1	
	0	
7	7	0
	6	0
	5	0
	4	0
	3	Focus Near Limit (L)
	2	
	1	
	0	
8	7	0
	6	0
	5	0
	4	0
	3	Focus Position (HH)
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	0
	3	Focus Position (HL)
	2	
	1	
	0	
10	7	0
	6	0
	5	0
	4	0
	3	Focus Position (LH)
	2	
	1	
	0	
11	7	0
	6	0
	5	0
	4	0
	3	Focus Position (LL)
	2	
	1	
	0	

Byte	Bit	Comments
12	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
13	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	1
	0	Focus Mode 1: Auto 0: Manual
14	7	0
	6	0
	5	0
	4	0
	3	0
	2	0/1 (Optional)
	1	0/1 (Optional)
	0	0/1 (Optional)
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Camera control system inquiry commands .. Command Packet 8x 09 7E 7E 01 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	WB R_Gain (H)
	2	
	1	
	0	
3	7	0
	6	0
	5	0
	4	0
	3	WB R_Gain (L)
	2	
	1	
	0	
4	7	0
	6	0
	5	0
	4	0
	3	WB B_Gain (H)
	2	
	1	
	0	
5	7	0
	6	0
	5	0
	4	0
	3	WB B_Gain (L)
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	OnePush RES
	3	0: Inquiring 1: OK 2: NG
	2	WB Mode
	1	0: Auto 1: Indoor 2: Outdoor
	0	3: OnePush 5: Manual
7	7	0
	6	0
	5	0
	4	0
	3	Aperture Gain
	2	
	1	
	0	
8	7	0
	6	0
	5	0
	4	Exposure Mode
	3	0x0: Auto 0x3: Manual
	2	0xA: Shutter Pri
	1	0xB: Iris Pri 0xD: Bright
	0	0x10: SpotLight
9	7	0
	6	0
	5	0
	4	0
	3	0
	2	Back Light 1:On 0:Off
	1	Exposure Comp. 1:On 0:Off
	0	1
10	7	0
	6	0
	5	0
	4	Shutter Position
	3	
	2	
	1	
	0	
11	7	0
	6	0
	5	0
	4	Manual Iris Position
	3	
	2	
	1	
	0	

Byte	Bit	Comments
12	7	0
	6	0
	5	0
	4	0
	3	Manual Gain Position
	2	
	1	
	0	
13	7	0
	6	0
	5	0
	4	Bright Position
	3	
	2	
	1	
	0	
14	7	0
	6	0
	5	0
	4	0
	3	Exposure Comp. Position
	2	
	1	
	0	
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Other inquiry commands..Command Packet 8x 09 7E 7E 02 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	Power 1: On 0: Off
3	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
4	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
5	7	0
	6	0
	5	0
	4	0
	3	Picture Effect Mode
	2	
	1	
	0	

Byte	Bit	Comments
6	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
7	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
8	7	0
	6	0
	5	0
	4	0
	3	Camera ID (HH)
	2	
	1	
	0	
9	7	0
	6	0
	5	0
	4	0
	3	Camera ID (HL)
	2	
	1	
	0	
10	7	0
	6	0
	5	0
	4	0
	3	Camera ID (LH)
	2	
	1	
	0	
11	7	0
	6	0
	5	0
	4	0
	3	Camera ID (LL)
	2	
	1	
	0	

Byte	Bit	Comments
12	7	0
	6	0
	5	0
	4	1
	3	0
	2	0
	1	0
	0	System 1:50/25/PAL 0:59.94/29.97/NTSC
13	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
14	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

Enlargement Function Query Command .... Command Packet 8x 09 7E 7E 03 FF

Byte	Bit	Comments
0	7	Destination Address
	6	
	5	
	4	
	3	Source Address
	2	
	1	
	0	
1	7	0 Completion Message (50h)
	6	1
	5	0
	4	1
	3	0
	2	0
	1	0
	0	0
2	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
3	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
4	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
5	7	0
	6	0
	5	0
	4	0
	3	0
	2	1
	1	0
	0	1
6	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
7	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
8	7	0
	6	0
	5	0
	4	0
	3	1
	2	0
	1	0
	0	0
9	7	0
	6	0
	5	0
	4	0
	3	1
	2	0
	1	0
	0	0
10	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
11	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
12	7	0
	6	0
	5	0
	4	0
	3	0
	2	0
	1	0
	0	0
13	7	0
	6	0
	5	0
	4	0
	3	Auto Slow Shutter Limit
	2	
	1	
	0	
14	7	0
	6	0
	5	0
	4	0
	3	D-Zoom Limit
	2	
	1	
	0	
15	7	1 Terminator (FFh)
	6	1
	5	1
	4	1
	3	1
	2	1
	1	1
	0	1

VISCA Command Setting Values

Exposure Control (1/2)

		59.94/29.97/NTSC	50/25/PAL
Shutter Speed	15	10000	10000
	14	6000	6000
	13	4000	3500
	12	3000	2500
	11	2000	1750
	10	1500	1250
	0F	1000	1000
	0E	725	600
	0D	500	425
	0C	350	300
	0B	250	215
	0A	180	150
	09	125	120
	08	100	100
	07	90	75
	06	60	50
	05	30	25
	04	15	12
	03	8	6
	02	4	3
	01	2	2
Iris	11	F1.8	
	10	F2.0	
	0F	F2.4	
	0E	F2.8	
	0D	F3.4	
	0C	F4.0	
	0B	F4.8	
	0A	F5.6	
	09	F6.8	
	08	F8.0	
	07	F9.6	
	06	F11	
	05	F14	
	04	F16	
	03	F19	
	02	F22	
	01	F26	
	00	CLOSE	

Gain	07	18 dB
	06	15 dB
	05	12 dB
	04	9 dB
	03	6 dB
	02	3 dB
	01	0
	00	–3 dB

Exposure Control (2/2)

		IRIS	GAIN
Bright	17	F1.8	18 dB
	16	F1.8	15 dB
	15	F1.8	12 dB
	14	F1.8	9 dB
	13	F1.8	6 dB
	12	F1.8	3 dB
	11	F1.8	0
	10	F2.0	0
	0F	F2.4	0
	0E	F2.8	0
	0D	F3.4	0
	0C	F4.0	0
	0B	F4.8	0
	0A	F5.6	0
	09	F6.8	0
	08	F8.0	0
	07	F9.6	0
	06	F11	0
	05	F14	0
	04	F16	0
	03	F19	0
	02	F22	0
	01	F26	0
	00	CLOSE	0

		Step	GAIN
Exposure Comp.	0E	+7	+10.5 dB
	0D	+6	+9 dB
	0C	+5	+7.5 dB
	0B	+4	+6 dB
	0A	+3	+4.5 dB
	09	+2	+3 dB
	08	+1	+1.5 dB
	07	0	0 dB
	06	–1	–1.5 dB
	05	–2	–3 dB
	04	–3	–4.5 dB
	03	–4	–6 dB
	02	–5	–7.5 dB
	01	–6	–9 dB
	00	–7	–10.5 dB

Zoom Ratio and Zoom Position (for reference)

Zoom Ratio	Optical Zoom Position Data	D-Zoom Ratio
×1	0000	
×1.2	0800	
1.5	1000	
×1.9	1800	
×2.5	2000	
×3.4	2800	
×4.8	3000	
×6.8	3800	
×10.1	4000	
	4000	×1
	5bc0	×1.5
	69c0	×2
	7e80	×4

Focus and Focus Distance (for reference)

Focus Position	1000: Over Inf to 7600: 0.10 m Far end Near end	
Focus Near Limit	2000: 2.99 m 3000: 1.29 m 4000: 0.75 m 5000: 0.47 m 6000: 0.24 m 7000: 0.19 m 7600: 0.10 m	As the distance on the left will differ due to temperature characteristics, etc., use as approximate values. *The lower 1 byte is fixed at 00.

Others

R,B gain	00~FF
Aperture	00~0F

Pan/Tilt Status Code List

P	Q	R	S	
- - - -	- - - -	0 - - -	- - - 1	A Pan movement all the way to the left
- - - -	- - - -	0 - - -	- - 1 -	A Pan movement all the way to the right
- - - -	- - - -	0 - - -	- 1 - -	A Tilt movement all the way up
- - - -	- - - -	0 - - -	1 - - -	A Tilt movement all the way down
- - - -	- - - -	- - 0 0	- - - -	Pan movement is correct
- - - -	- - - -	- - 0 1	- - - -	Pan position cannot be detected
- - - -	- - - -	- - 1 0	- - - -	The Pan mechanism is abnormal
- - - -	- - 0 0	0 - - -	- - - -	The Tilt movement is correct
- - - -	- - 0 1	0 - - -	- - - -	The Tilt position cannot be detected
- - - -	- - 1 0	0 - - -	- - - -	The Tilt mechanism is abnormal
- - - -	0 0 - -	0 - - -	- - - -	No movement instructions
- - - -	0 1 - -	0 - - -	- - - -	In the midst of a Pan/Tilt
- - - -	1 0 - -	0 - - -	- - - -	Pan/Tilt completed
- - - -	1 1 - -	0 - - -	- - - -	Pan/Tilt failed
- - 0 0	- - - -	0 - - -	- - - -	Not initialized
- - 0 1	- - - -	0 - - -	- - - -	Initializing
- -1 0	- - - -	0 - - -	- - - -	Initialization completed
- -1 1	- - - -	0 - - -	- - - -	Initialization failed

(- : optional)

Pan/Tilt Position (for reference)

	Parameter (position)
PAN	FA60 (–100 degree) to 05A0 (+100 degree)
TILT	FE98 (–25 degree) to 0168 (+25 degree)

LED Status

Status			POWER (Green)	STANDBY (Orange)
Main power ON	Power On (including initializing period)		On	Off
		When receiving infrared signals form Remote Commander	Blinking	Off
		At position detection error	On	Blinking
	Sandby status Power off by VISCA or the Remote Commander		Off	On
Main power Off			Off	Off
Initialization error	Pan/tilt error		Blinking	Blinking
	Internal error(LSI, etc.)		Blinking alternately	
BOTTOM switch and SYSTEM SELECT switch	Setting error (Example: when the SYSTEM SELECT switch is set to 7 or F.)		On	On

Specifications

System

Video signal: 1080i/59.94, 1080i/50, 1080p/29.97, 1080p/25, 720p/59.94,720p/50, 720p/29.97, 720p/25, NTSC (LB), NTSC (CR), NTSC (SQ), PAL (LB), PAL(CR), PAL (SQ) (switched with the SYSTEM SELECT switch)

Synchronization: Internal synchronization

Image device: 1/3 type (6 mm), CMOS
Effective picture elements: Approx. 2,000,000 pixels

Lens: 10 × (optical), 40 × (digital) f = 3.4 – 33.9 mm, F1.8 – F2.1
Horizontal angle: 8 (TELE end) to 70 degrees (WIDE end) (When an HD signal is output)

Minimum object distance: 100 mm (4 inches) (WIDE end)

Minimum illumination: 15 lux (F1.8) with 50 IRE

Shutter speed: 1/2 to 1/10,000 sec.

Video S/N: 50 dB

Pan/tilt action: Horizontal: ± 100 degrees
Maximum panning speed: 300 degrees/sec.
Vertical: ± 25 degrees
Maximum tilting speed: 125 degrees/sec.

Input/output connectors

Video output: COMPONENT (HD OUT): D-sub 15-pin
Y: 1Vp-p (tri-level sync, at 75-ohm termination)
Pb/Pr: ± 350 mVp-p, 75-ohm terminated
HD/VD Sync: 1Vp-p, 75-ohm terminated
Tri-level Sync: ± 300 mVp-p,75-ohm terminated
HD-SDI (HD OUT): BNC type, 800 mVp-p, 75 -ohm, conforming to SMPTE 292M serial interface standard
VIDEO (SD OUT): RCA phono jack 1 Vp-p, 75-ohm unbalanced
Synchronization: negative
S VIDEO (SD OUT): Mini DIN 4-pin type

Control input/output: VISCA IN: Mini DIN 8-pin type, RS-232C
VISCA OUT: Mini DIN 8-pin type, RS-232C

Power connector: JEITA type4 (DC IN 12V)

General

Input voltage: 12 V DC (10.8 to 13.0 V DC)

Current consumption: 2.5 A max. (at 12 V DC)

Operating temperature: 0°C to 40°C (32°F to 104°F)

Storage temperature: –20°C to +60°C (-4°F to 140°F)

Dimensions: Video camera: 259 × 150 × 169 mm (10 1/4 × 6 × 6 3/4 inches) (w/h/d)
Remote Commander: 56 × 26 × 210 mm (2 1/4 × 1 1/16 × 8 3/8 inches) (w/h/d)

Mass: Video camera: Approx. 2 kg (4 lb 7 oz)
Remote Commander: 190 g (3.8 oz)

Installation angle: Less than ± 15 degrees to the horizontal surface

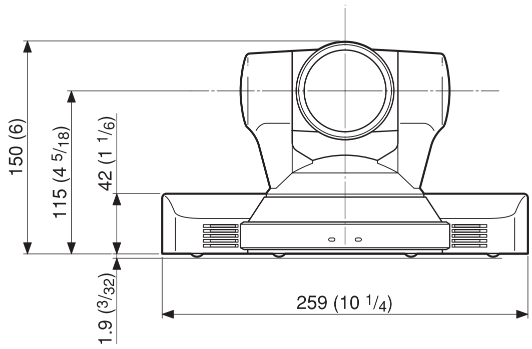
Supplied accessories

AC power adaptor (1)
AC power cord (1)
Remote Commander (1)
Operating Instructions (1)

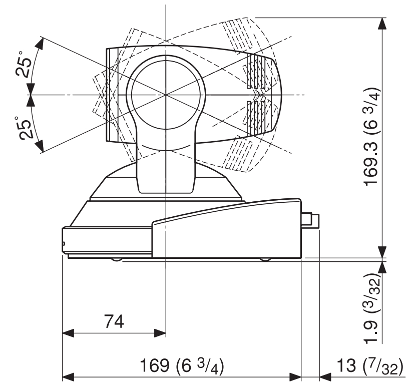
Design and specifications are subject to change without notice.

Dimensions

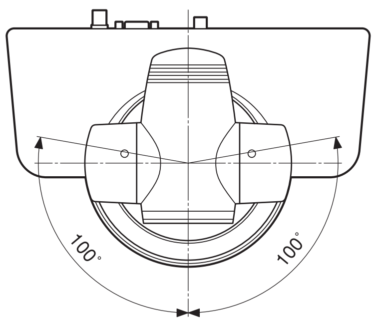
Front



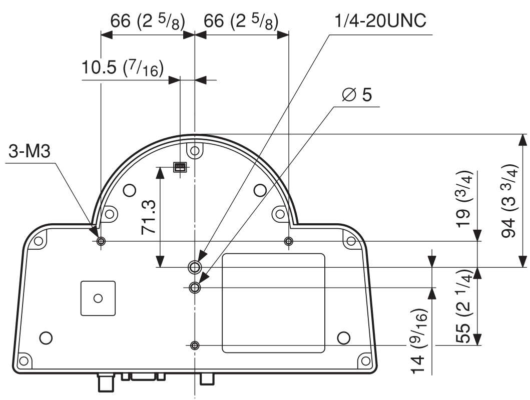
Side



Top



Bottom



Unit: mm (inches)

Precautions

Software

Use of the demonstration software developed by Sony Corporation or use of the software with customer developed application software may damage hardware, the application program or the camera. Sony Corporation is not liable for any damages under these conditions.

Operation

Start the camera control software on your computer after you turn on the camera and the image is displayed.

Operation and storage locations

Do not shoot images that are extremely bright (e.g., light sources, the sun, etc.) for long periods of time. Do not use or store the camera in the following extreme conditions:

- Extremely hot or cold places (operating temperature 0 °C to +40 °C (32 °F to 104 °F))
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters
- Where it is subject to fluorescent light reflections
- Where it is subject to unstable (flickering, etc.) lighting conditions
- Where it is subject to strong vibration

Care of the unit

Remove dust or dirt on the surface of the lens with a blower (commercially available).

Other

Do not apply excessive voltage. (Use only the specified voltage.) Otherwise, you may get an electric shock or a fire may occur.

In case of abnormal operation, contact your authorized Sony dealer or the store where you purchased the product.